

Fig. 1

Prior Art

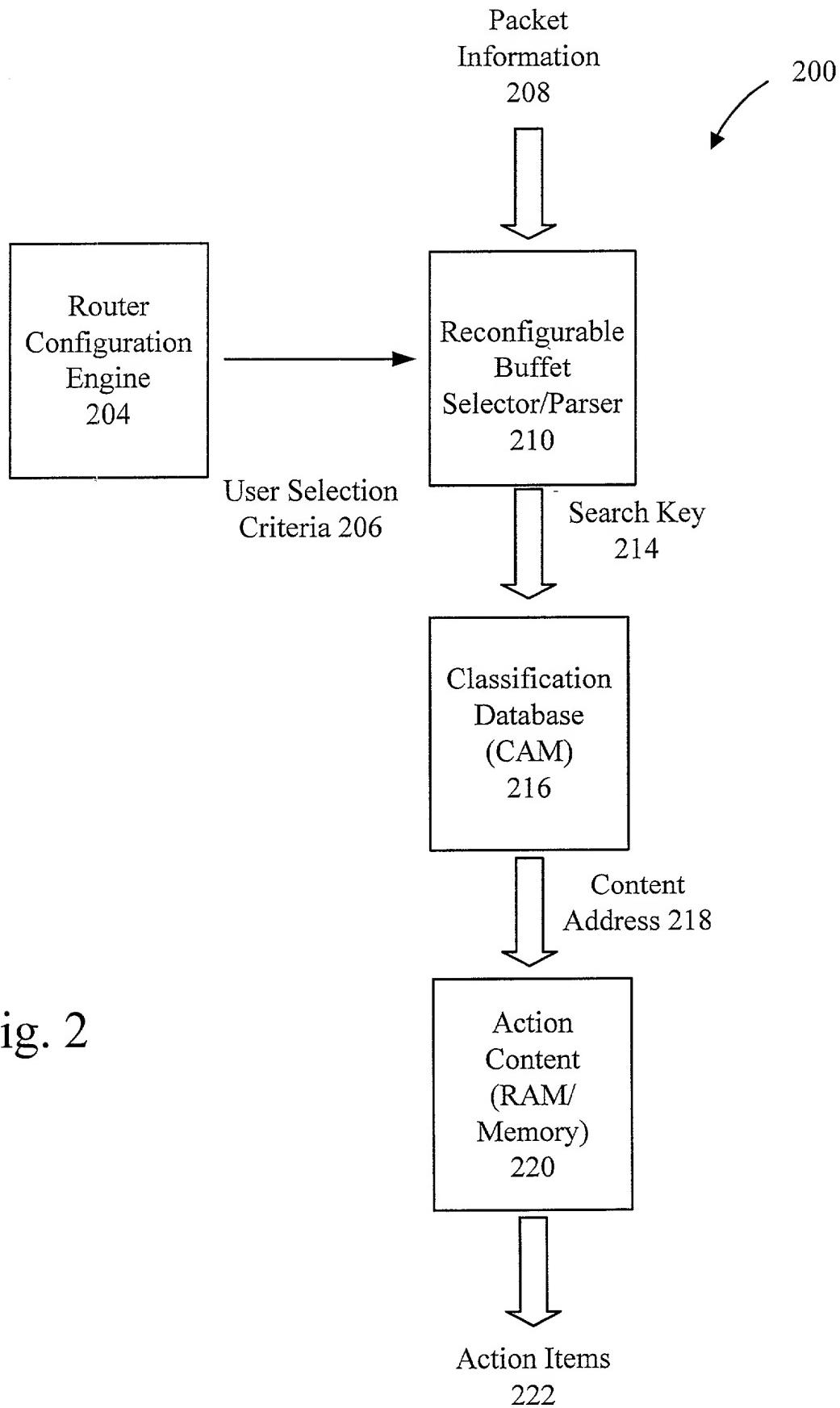


Fig. 2

Fig. 3

Origin	Fields (number of bits)
<ul style="list-style-type: none"> • From Packet Status Information 	<ul style="list-style-type: none"> ▪ Packet length ▪ Packet type: Ethernet, ATM, ... ▪ Input/Output port ▪ 802.1p tagged/untagged packet ▪ Incoming time of day
<ul style="list-style-type: none"> • From OSI Layers: 	
<input checked="" type="checkbox"/> Layer 2 Fields option	<ul style="list-style-type: none"> ▪ 802.1p fields: <ul style="list-style-type: none"> * Priority (3) * Vlan ID (12) * Tag/Untag (1) ▪ Source Mac Address (48) ▪ Destination Mac Address (48) ▪ Ethernet-SNAP ▪ LLC DSAP (8) & SSAP (8) ▪ Ethernet Type (e.g. IP, IPX, ARP, Appletalk, and so on.)
<input checked="" type="checkbox"/> Layer 3 Fields option	<ul style="list-style-type: none"> ▪ IP packet option <ul style="list-style-type: none"> * Source IP (32) * Destination IP (32) * Protocol Type (8) * DSCP (6) * IP option (1) ▪ IPX packet option <ul style="list-style-type: none"> * Destination Network (32) * Destination Node (48) * Source Network (32) * Source Node (48) * Packet Type (8)
<input checked="" type="checkbox"/> Layer 4 Fields option	<ul style="list-style-type: none"> ▪ IP packet option <ul style="list-style-type: none"> * Source Port (16) (range) * Destination Port (16) (range) * TCP flag (6) ▪ IPX packet option <ul style="list-style-type: none"> * Destination Socket (16) * Source Socket (16)
<ul style="list-style-type: none"> • From bit-mask patterns specified by (header, start, end) where: 	<ul style="list-style-type: none"> ▪ “header” means the header of a specific layer, and it could be L2, L3, L4, or L5. ▪ “start” means the starting bit from the header ▪ “end” means the ending bit from the header

Fig. 4a

Packet Types	Field Name	Bits	Total Bits	Description
Basic Layer 2				
	Destination Mac Address	48		Destination Mac Address
	Source Mac Address	48		Source Mac address
			96	
Basic IP Layer 3				
	Source IP	32		Source IP address
	Destination IP	32		Destination IP address
			64	
Basic IPX Layer 3				
	Destination Network	32		Destination Network
	Destination Node	48		Destination Node
	Destination Network	32		Destination Network
	Destination Node	48		Destination Node
			160	
Basic Layer 4				
	Source IP	32		Source IP address
	Destination IP	32		Destination IP address
	Protocol Type	8		Protocol type
	Source Port	16		Source TCP/UDP ports
	Destination Port	16		Destination TCP/UDP ports
			104	
DiffServ-BA				
	DSCP	6		DSCP value
			6	
DiffServ-MF				
	Source IP	32		Source IP address
	Destination IP	32		Destination IP address
	Protocol Type	8		Protocol type
	Source Port	16		Source TCP/UDP ports
	Destination Port	16		Destination TCP/UDP ports
	DSCP	6		DSCP value
			110	

Fig. 4b

Packet Types	Field Name	Bits	Total Bits	Description
Web switching	Source IP	32		Source IP address
	Destination IP	32		Destination IP address
	Protocol Type	8		Protocol type
	Source Port	16		Source TCP/UDP ports
	Destination Port	16		Destination TCP/UDP ports
	TCP flag	6		Flag bits in TCP header
			110	
IP Filtering & Layer 2 QOS	Destination Mac Address	48		Destination Mac Address
	Source Mac Address	48		Source Mac address
	L2_priority	3		802.1p user priority
	Destination IP	32		Destination IP address
			131	
IP Layer 2-3 QOS	Source IP	32		Source IP address
	Destination IP	32		Destination IP address
	DSCP	6		DSCP value
	L2_priority	3		802.1p user priority
	Destination Mac Address (Or Source Mac Address)	48		Destination Mac address (or Source Mac Address)
			121	
IP Layer 2-4 QOS	Source IP	32		Source IP address
	Destination IP	32		Destination IP address
	Protocol Type	8		Protocol type
	Source Port	16		Source TCP/UDP ports
	Destination Port	16		Destination TCP/UDP ports
	DSCP	6		DSCP value
	L2_priority	3		802.1p user priority
			113	

Fig. 5

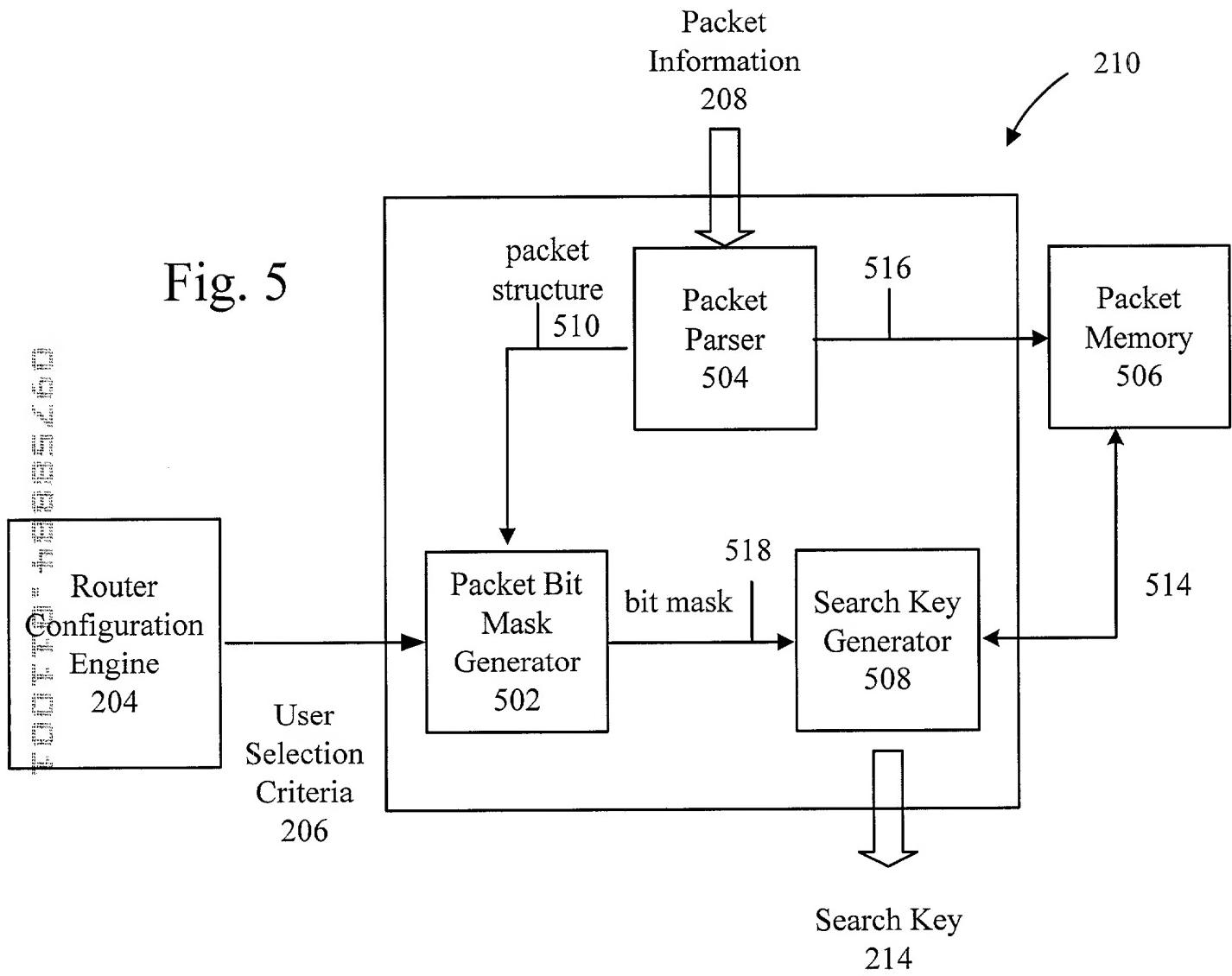
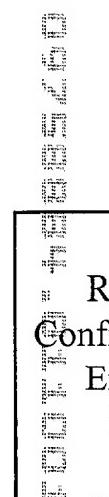


Fig. 6

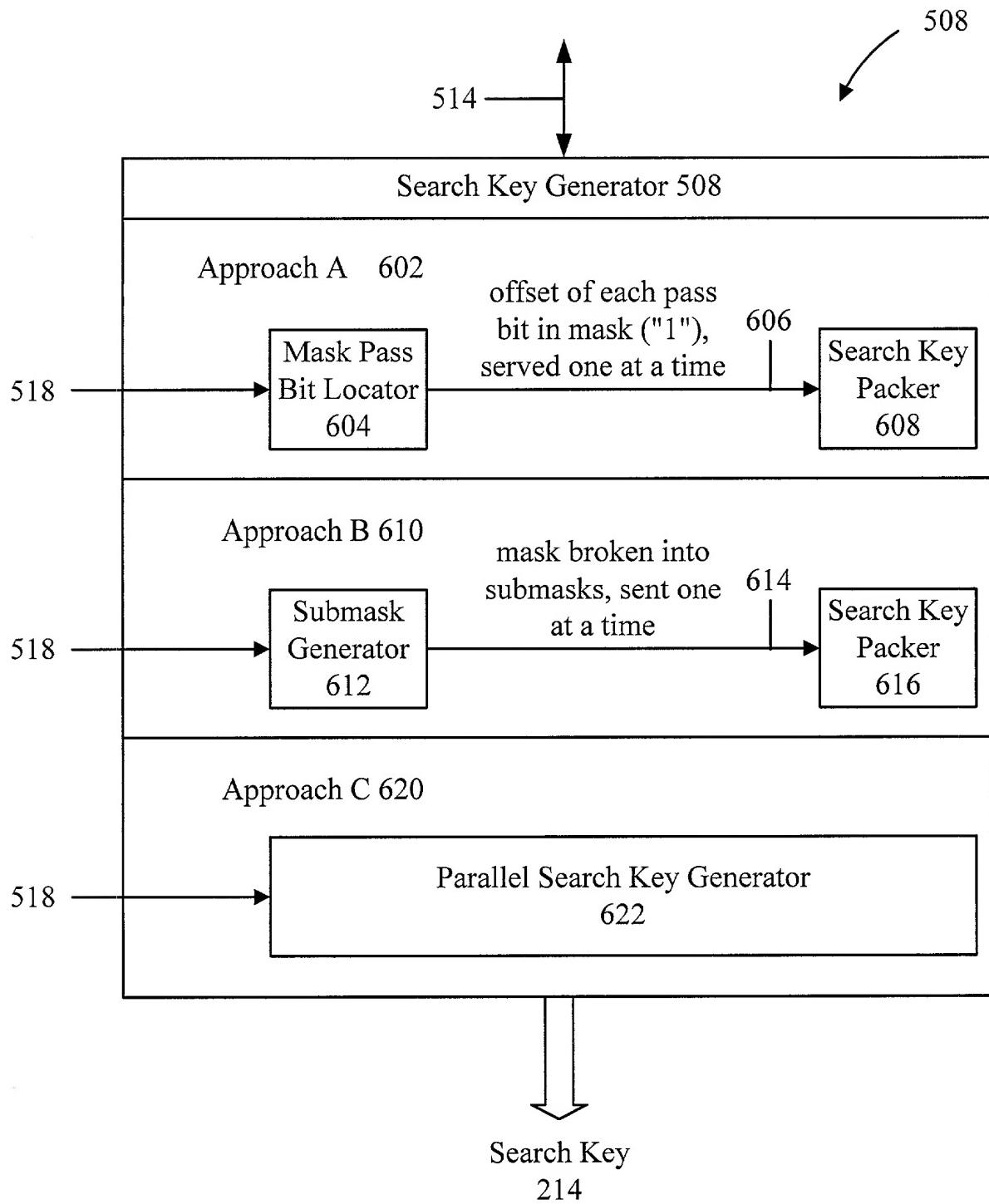
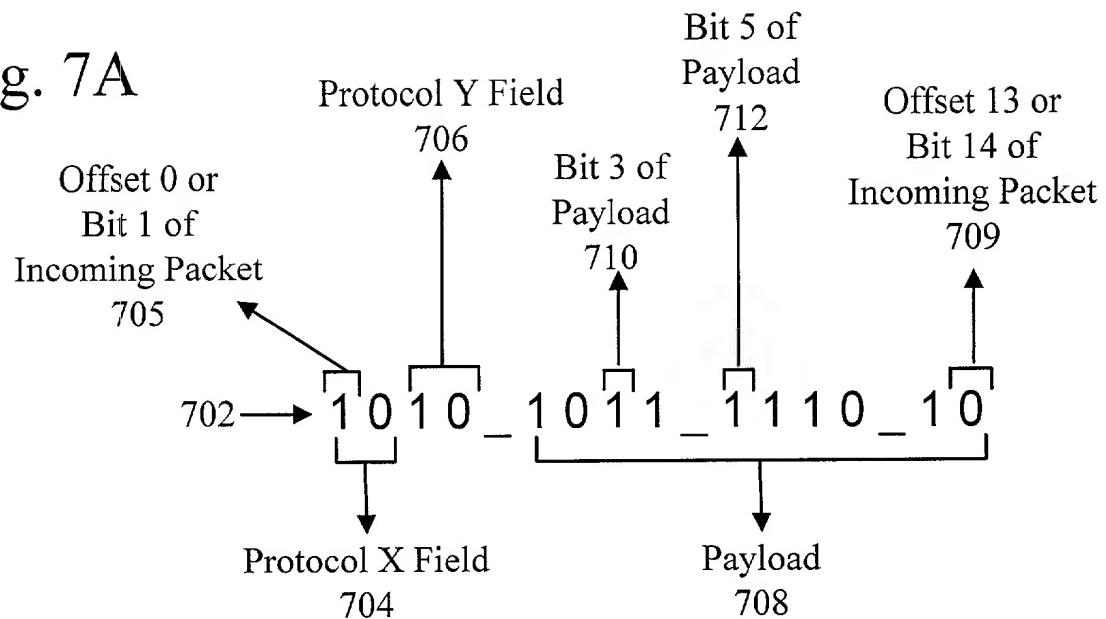


Fig. 7A



714 → 0 0 1 1 _ 0 0 1 0 _ 1 0 0 0 _ 0 0

716 → 1 0 1 1

Fig. 7B

1: Incoming packet passes through the packet parser into the packet memory. Concurrently, the packet structure information is sent to the packet bit mask generator.

2: The classification or the selection criteria and the packet structure information are input into the packet bit mask generator, which block outputs the bit mask **0011_0010_1000_00**.

3: One clock cycle at a time, the mask bit locator outputs the offset values 2, 3, 6, 8.

4: Offset 2 reads a “1” from memory, offset 3 reads a “0”, offset 6 reads a “1”, and offset 8 reads a “1”

5: The search key packer packs or collects these bits into the search key “1011”.

Fig. 8

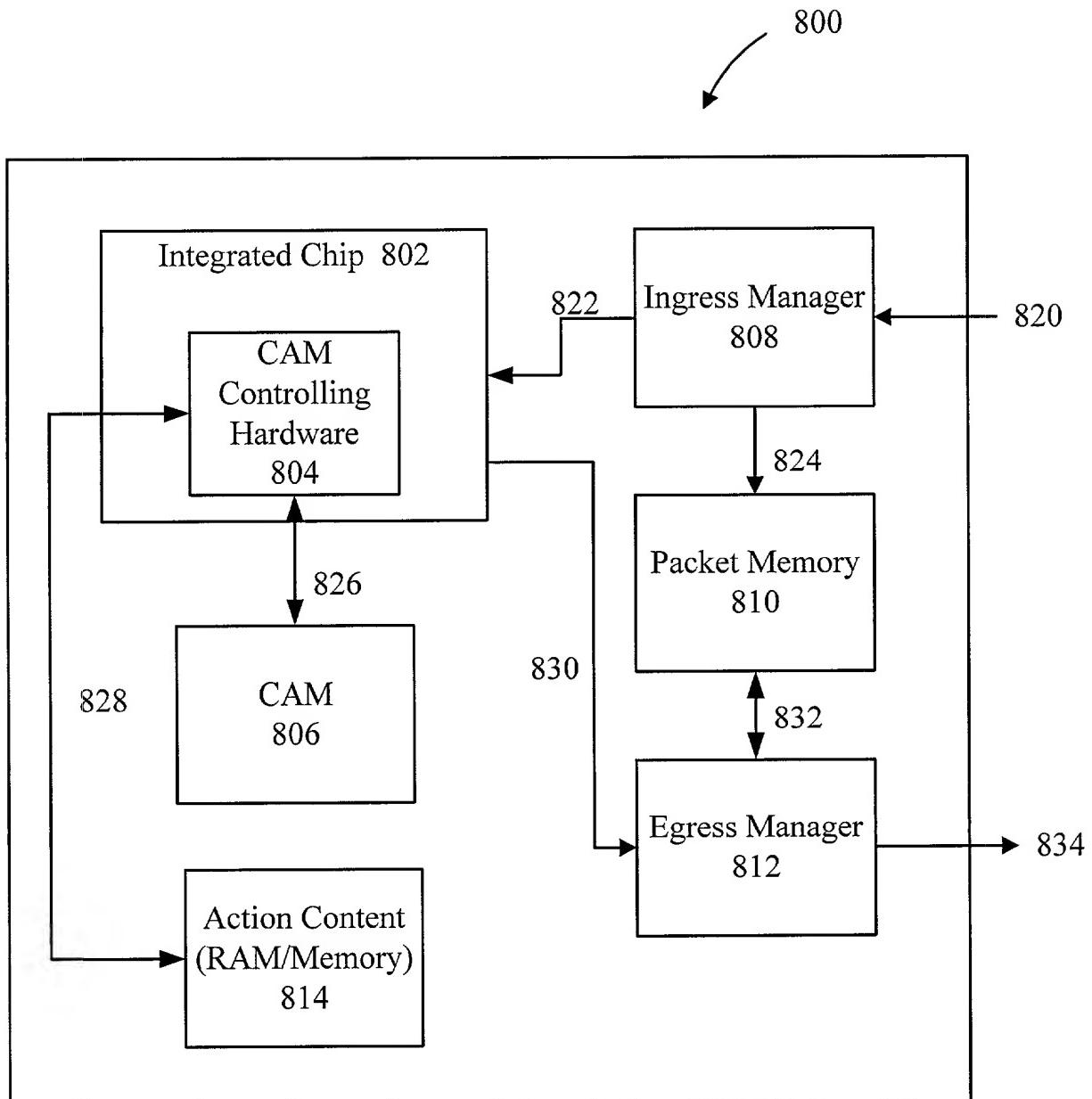


Fig. 9

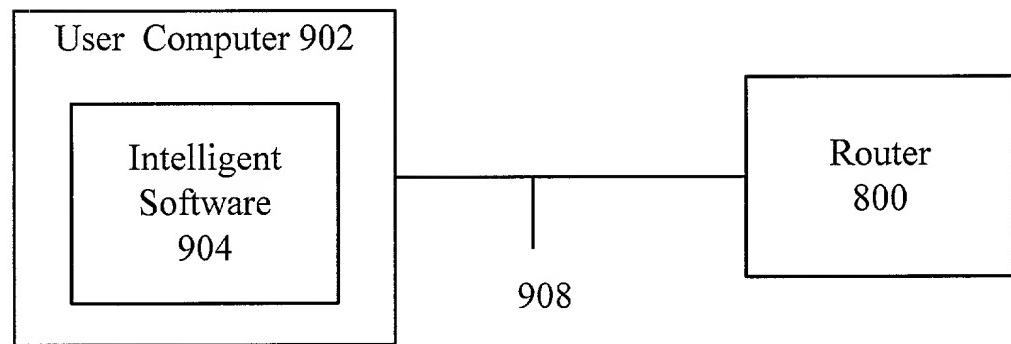


Fig. 10

